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Standardised Baselines

Options to Strategically Advance National Climate Policies

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for Climate, Environment
and Energy

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Summary

Standardised Baselines (SB) establish national (or regional) greenhouse gas (GHG) emission benchmarks which may e.g. serve as baseline emission factor for all CDM projects in one specific sector in a host country. In contrast to the standard CDM, host country governments possess a much more central role under the SB framework: Every SB has to be proposed through the host countries Designated National Authority (DNA). This creates an opportunity for host countries to engage strategically in the development of SBs in order to advance their overall climate policy agenda.

In this policy brief we discuss the opportunities and obligations of host country DNAs within the SB framework and identify options for strategic intervention. Host countries can of course prioritize by selecting the right sectors for which they develop an SB in the first place.

We demonstrate that by choosing the right level of aggregation of the sector to be covered, DNAs can tailor their SBs to some extent to support certain technologies, fuels or feedstocks over others.

Furthermore, it is at the host countries' discretion to decide whether or not an SB should be mandatory or not, once it is approved. While we generally recommend that the application of an SB should be mandatory, there may be certain configurations of the sector that give reason to deviate from that recommendation.

Last but not least, we discuss the DNAs' role in managing the data for the development and maintenance of the SB. We recommend that host countries should take full advantage of potential synergies between data collection for SBs and other data intensive processes such as national greenhouse gas inventories or national statistics. SBs and the data gathered in the process of developing them can also be a basis for the development of other mitigation instruments such as Nationally Appropriate Mitigation Actions (NAMAs) or New Market Mechanisms (NMM).

1 Introduction

Standardised Baselines (SB) establish national (or regional) greenhouse gas (GHG) emission benchmarks which may e.g. serve as baseline emission factor for all CDM projects in one specific sector in a host country. The concept was introduced as a tool to broaden the scope of the CDM beyond a purely project-based mechanism towards a more comprehensive sectoral one, to streamline the project cycle as well as to decrease transaction costs and thus to improve accessibility for smaller scale projects that would otherwise not be able to recoup the upfront investment. Last but not least SBs can serve to improve environmental integrity by following a more standardised and thus more robust approach towards additionality demonstration.

The decision to promote the standardization of baselines and monitoring methodologies under the CDM was made by the Conference and Meeting of the Parties to the Kyoto Protocol in Cancun 2010 (CMP6). Parties explicitly noted *"that the use of standardized baselines could reduce transaction costs, enhance transparency, objectivity and predictability, facilitate access to the clean development mechanism, particularly with regard to underrepresented project types and regions, and scale up the abatement of greenhouse gas emissions, while ensuring environmental integrity"* (UNFCCC 2011, p. 2). Hence, the tool of SBs is still relatively new and the regulatory framework is still work in progress. In fact, the CDM project standard has only been update in June 2014 to make provision on how CDM projects should apply approved SBs (CDM Executive Board 2014a). The relevant documents have all received updates fairly recently or are about to be updated soon. See Box 1 for an overview of the pertinent procedures and guidelines with respect to SBs.

Box 1: Documentation of the SB Framework

- Procedure for the development, revision, clarification and update of standardized baselines, Version 3.01: CDM EB75, Annex 33;
- Guidelines for the Establishment of Sector-Specific Standardized Baselines, Version 2.0: CDM EB65, Annex 23;
- Guidelines for Quality Assurance and Quality Control of Data used in the Establishment of Standardised Baselines, Version 2.0: CDM EB79, Annex 7;
- Standard: Determining Coverage of Data and Validity of Standardized Baselines, Version 1.0: CDM EB77, Annex 5;
- Guidelines for the Consideration of Suppressed Demand in CDM Methodologies, Version 2.0: CDM EB68, Annex 2;
- Establishment of standardised baselines for afforestation and reforestation project activities under the CDM, Version 1.0: CDM EB70, Annex 10;

Despite the recent crisis of international carbon markets (Michaelowa 2013; Hermwille 2013) the development of SBs and the SB framework is one of the few remaining frontiers at which the CDM is being actively advanced, not only by the UNFCCC Secretariat, but also by international development agencies and national DNAs. A total of 23 SBs have been proposed to date (November 2014) six of which have been approved by the CDM Executive Board. Given the extremely low price levels of the recent time, the prospects of revenues from CDM projects built on these SBs can hardly explain this interest in the development of SBs.

The UNFCCC diplomacy is moving forward and as it is moving forward new instruments have become available, instruments that supposedly play a significant in the future climate treaty to be adopted in Paris in 2015. These instruments include Nationally Appropriate Mitigation Actions (NAMAs) and New Market Mechanisms (NMM). Both NMM and NAMAs may require the establishment of a business as usual (BAU) scenario and a project/programme scenario in terms of GHG emissions. This is where the experience gained by the CDM can be a valuable resources. However, the 244 approved methodologies of the standard CDM (as of November 2014) are often very case-specific, supposedly too specific to allow for the development of emission benchmarks for a whole sector at national scale. SBs are considered as an instrument that may allow for transferring the knowledge and the wealth of methodological approaches to such new climate financing mechanisms (e.g. Burian et al. 2013; Arnaoudov 2014). As the SB rules and procedures are developed under the UNFCCC framework, SBs are internationally recognized boosting the credibility of any national mitigation efforts.

In this policy brief we will investigate if and how SBs can be used by host countries to strategically advance their climate policy agenda and at which stages of the SB design process there is room for strategic intervention. We will do so by firstly discussing the role of host country governments in the development of SBs (chapter 2). Consequently (chapter 3), we will discuss the various stages of the SB development process in more detail highlighting possible leverage points for strategic policy making and the associated consequences . Chapter 4 concludes.

2 The Role of Governments

The role of host country governments is much stronger in the proposition and administration of SBs than with the standard CDM and even Programmes of Activities (PoAs) under the CDM. Under the standard CDM and PoAs national governments have to establish Designated National Authorities (DNAs) that are in charge of processing proposed CDM projects. Within the project cycle, DNAs are responsible to provide Letters of Approval to the project proponents that affirm that a proposed CDM activity is in line with national legislation. DNAs are also tasked with assessing whether or not a project contributes to the sustainable development of the host country, and, eventually, decide upon the approval of a project.

Since the development of projects was to be initiated by the private sector – by the companies hosting the projects, by specialised project developers or by foreign investors looking for opportunities to comply with their obligations under the EU ETS – setting sustainable development criteria was the only means of steering the development of CDM projects in the desired direction. The issue of who and how "sustainable development" should be defined in the context of the CDM was subject to a lengthy and heated debate (Holm Olsen 2007), but finally it was affirmed in the CDM Modalities and Procedures at COP 7 in Marrakech *"that it is the host Party's prerogative to confirm whether a clean development mechanism project activity assists it in achieving sustainable development"* (UNFCCC 2002, p 20). In fact, DNAs have interpreted this prerogative quite differently and developed a wide range of criteria to assess the sustainable development contributions of a proposed CDM project. They include economic factors such as increased (foreign) investments, employment generation, income generation, the development of clean energy sources, and encouragement of touristic activity. Furthermore, many countries apply technological criteria such as development of technical skills and capabilities, contribution to technological innovation or transfer of technologies. While some countries have focused very narrowly on one or two aspects, others apply a wide range of indicators in their sustainability assessments (Tewari 2012).

All in all, host country governments possess only limited means of spurring and steering sustainable development – including energy and climate policy – with the standard CDM and even the modality of PoAs. However, with the move to more sectoral approaches under the CDM, namely with the advent of sector-specific standardised baselines for the determination of baseline emission factors and the possibility of establishing positive lists of technologies, fuels or feedstocks that are deemed automatically additional, there is considerably more room for a proactive role of DNAs in promoting the CDM in their respective countries.

2.1 Proposing the Standardised Baseline

While under the standard CDM, the DNA's role is limited to assessing proposed projects and approving them, DNAs have a more central role for standardised baselines. Project participants, industry organizations or other admitted observer organisations, i.e. any organisation that is registered for participation at UNFCCC meetings, can propose a standardised baseline only <u>through</u> the DNA of the host country (CDM Executive Board 2012, §6). That leaves the DNAs with the opportunity and responsibility of engaging at an early stage in the process of developing an SB.

In fact, many DNAs have been engaged quite substantially in the development of standardised baseline. One example is the standardised baseline developed for the rice mill sector in Cambodia (Kingdom of Cambodia 2013). The concept of the SB and the technical documentation was developed in close cooperation between the Climate Change Department of the Ministry of Environment serving as the Cambodian DNA and the Japanese Institute for Global Environmental Strategies (IGES).[1]

By playing such a central role in the procedure for the submission of a SB, DNAs can engage proactively in the development of SBs and prioritize sectors where SBs can be particularly beneficial.

2.2 Ensuring Data Quality

DNAs are not only in charge of submitting proposed SBs to the UNFCCC Secretariat, they are also responsible for the quality and validity of the data used to develop that SB as well as keeping track of the data for future revisions and updates of the proposed SB.

The development of an SB is a highly data intensive process and high quality of data is crucial for the reliability and environmental integrity of the SB. In some cases data may be available through secondary sources, but in many other cases this may not be the case. DNAs are therefore required to establish quality control procedures in order to ensure that the data are relevant, complete, consistent, credible, current, accurate and objective. In addition, processing data to derive standardized baselines should be conservative, secure, transparent and traceable. According to the definition of the CDM Executive Board, *"Quality control (QC) [...] is a system of routine technical activities to be conducted by a DNA to assess and maintain the quality of the datasets. It begins with pre-submission QC activities, followed by post-submission QC activities, internal review and a summary of the QC implementation (QC report)"* (CDM Executive Board 2014b, §14b).

On a second level, DNAs are required to ensure that the QC system is working adequately, the routines are followed meticulously. They need to develop and establish a system of quality assurance (QA). *"QA is a system developed by a DNA to ensure that the QC system is designed to meet the data quality objectives [...] and that it is implemented effectively. The conformity and the effectiveness of the QC system are reviewed and the review activities/results are reported (assessment report) by DOEs."* (CDM Executive Board 2014b, §14c).

In other words, DNAs have full responsibility over the data that is gathered and used in SBs. Meeting highest data management standards as outlined in the QA/QC guidelines is a daunting task for many DNAs, especially those with limited capabilities, but even for more developed countries. However, it is also an opportunity. In a series of interviews conducted by Hermwille et al. (2013) respondents agreed that the QA/QC Guidelines are an essential element of the SB framework to ensure environmental integrity and hence the credibility of the approach. Furthermore, data management is seen as a key component that can add to the development of other mitigation instruments such as New Market Mechanisms (NMM), instruments under the NAMA framework or within the operations of the Green Climate Fund (GCF). Basically, any mitigation activity that entails a form of measurement, reporting and verification (MRV) could benefit from a robust data management

[1] Personal interviews with Mr Kamal Uy, Deputy Director of the Climate Change Unit of the Cambodian Minsitry of Environment serving as the Cambodian DNA (3 July 2013) and Ms Akiko Fukui, Policy Researcher Climate and Energy at IGES (8 July 2014).

system. Investment in the robust QA and QC systems is thus seen as paying a multiple dividend, especially when data management under the proposed SB is integrated with other data collection practices e.g. in the development of greenhouse gas inventories.

3 Options for Strategic Intervention

In this section we will discuss the various opportunities for DNAs to prioritize and direct the development of SBs in order to incentivise project activities in a desired area. We will do so by following the structure of the SB guidelines and highlighting options for strategic intervention at all relevant steps.

3.1 Choosing Sectors

3.1.1 Considerations for Prioritizing Sectors

The first and most straight forward question is what sector to choose for the development of a SB in the first place. UNDP (2013) have proposed a decision making process to aid DNAs in prioritizing and selecting the right sector(s) to develop a SB (see Figure 1 below). Additionally, we have identified a number of considerations to be made in the decision making process.

- **What are national priorities?**

Countries may have priorities for promoting development in certain sectors. For example, they might be interested in developing industrial production in a certain field or target households in order to reduce poverty through e.g. rural electrification or the distribution of improved energy efficient and clean cook stoves.

- **Where is the highest mitigation potential?**

The development of an SB requires a significant investment. The returns to this investment are likely to be highest where there is a high mitigation potential.

- **Where is the highest potential for CDM projects?**

The sector with the highest mitigation potential is not necessary the sector with the highest potential for CDM projects. It may be the case that mitigation potentials are difficult to leverage due to barriers such as unclear ownership or responsibility for carbon emissions. Other cases may be that it is hard to monitor and/or verify the emissions and/or emission reductions. This is true for example for the land-use sector.

- **Where can a SB have the highest impact on reducing transaction cost?**

The concept of standardised baselines was introduced explicitly with the hope that they could reduce transaction cost and facilitate access to the CDM, particularly with regard to underrepresented project types and regions (UNFCCC 2011). The development of SBs should therefore be prioritized for sectors where standard CDM methodologies have hitherto underperformed. SBs could have a large impact particularly in sectors where there is a large potential of rather small scale CDM projects for which a determination of baseline emissions and demonstration of additionality would incur transaction cost that exceed the potential earnings through the CDM.

Another option is to use the SB framework to develop a standardised grid emission factor for the country (or a region of countries) that can then be used in a wide range of project types from renewable energy projects to various types of energy efficiency projects. We will dis-

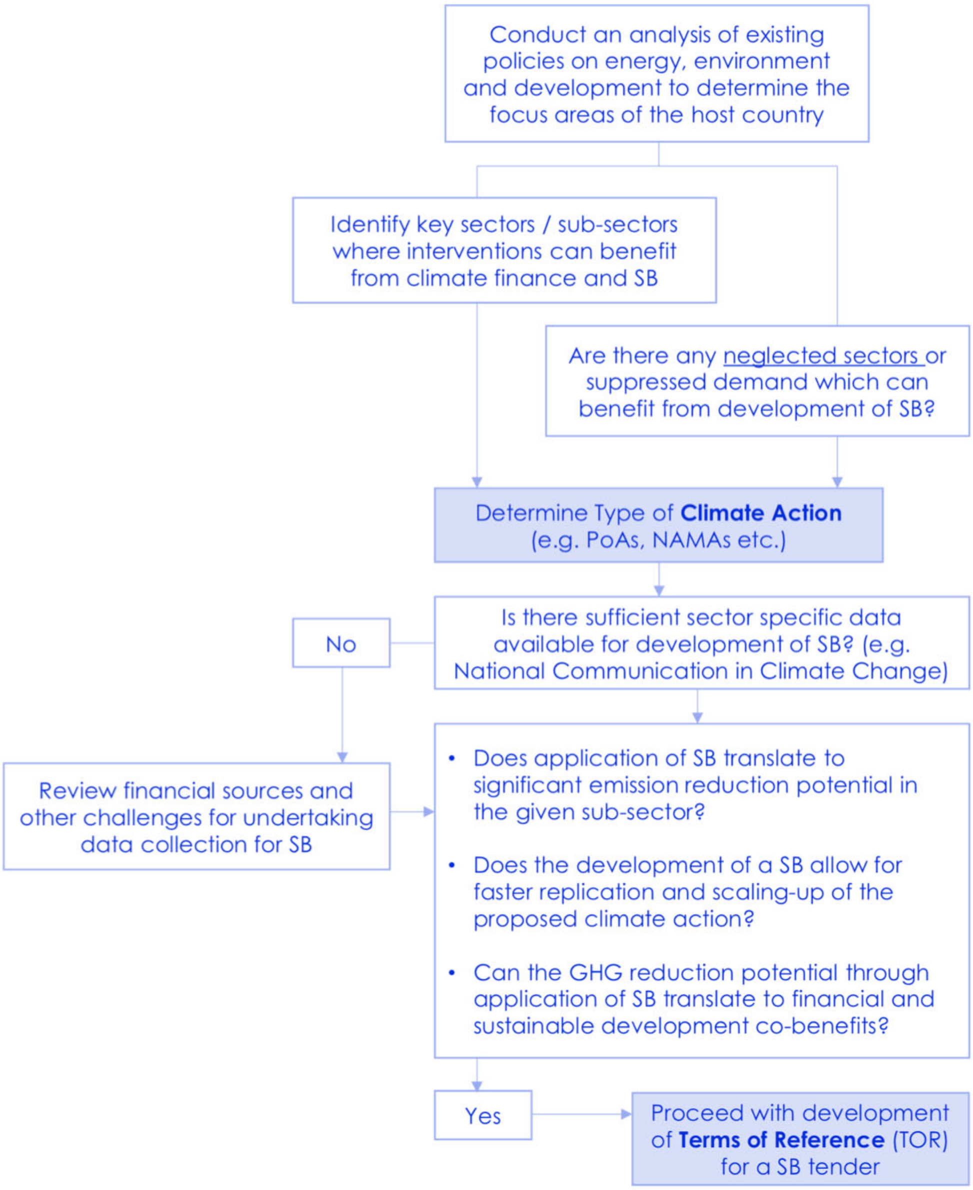

Figure 1: Schematic decision making process for standardised baseline sector identification. *Source: UNDP 2013.*

cuss that latter option more extensively in section 3.1.2 below.

For more advanced large-scale activities, despite being of national interest, it could be more appropriate to provide support to foster conventional CDM projects. SBs, in turn, are particularly valuable for small-scale activities, for example economic efficiency on the level of households and small and medium enterprises.

- **Which types of projects are likely to receive strongest demand?**

In times of plummeting prices on international carbon markets and not much for hope for early recovery of the market, it is unclear whether or not CDM projects can find a source of demand for the generated CERs. Currently, the only remaining buyers in the market are either institutional buyers from developed countries or buyers from the voluntary carbon market (Hermwille 2013). Institutional buyers include, inter alia, the World Bank's Pilot Auctioning Facility (World Bank 2014), the Carbon Initiative for Development (Ci-Dev) (World Bank 2013), the Norwegian Carbon Procurement Facility (NorCaP) and the NEFCO Carbon Fund (NEFCO 2014), the latter two procuring CERs for the national accounts for Nordic countries. What both institutional buyers and buyers at the voluntary market have in common, is that they typically apply selection criteria beyond the price of the CERs. For voluntary carbon markets it is highly appreciated if projects feature strong sustainable development co-benefits and can thus be used for promotion of the buyer's corporate social responsibility. Not all sectors and project types are equally apt for this type of marketing, though (Kreibich et al. 2013).

3.1.2 Overview of Proposed and Approved Standardised Baselines

The first SB submitted to the CDM EB was an SB for charcoal production for consumption in households and small and medium enterprises. It was submitted in May 2012 and was approved by the CDM Executive Board at its 73rd session end of May 2013. Since then, the number of proposed SBs has increased significantly. As of October 2014 a total of 23 SBs have been officially proposed and submitted to the UNFCCC Secretariat (UNFCCC 2014).

Thus far six different types of SBs have been proposed. By far the most common type are national (or regional) grid emission factors (11 national + 1 regional grid emission factor). The second most prolific type of SB is waste treatment, i.e. methane collection and/or destruction at landfill sites (6 proposed SBs). For all other types only one SB has been proposed each: charcoal production, clinker production, rural electrification, rice milling and rice cultivation. However, only six of the proposed SBs have been approved so far. **Figure 2** and **Figure 3** give an overview of the types of proposed and approved SBs respectively and their corresponding shares of the total of all SBs.

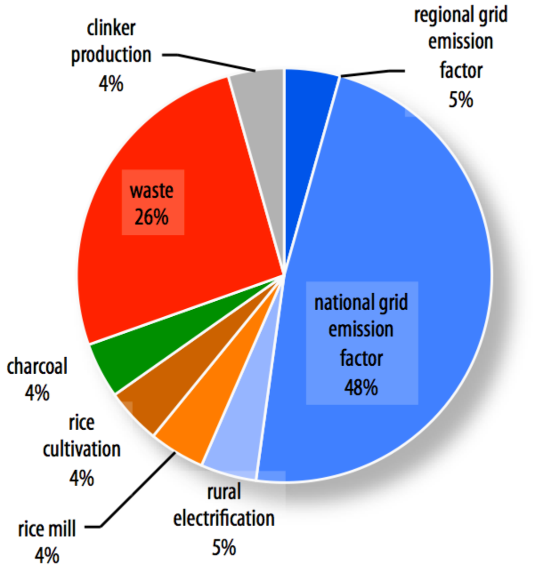

Figure 2: Overview of proposed standardised baselines as of October 2014. *Source: UNFCCC (2014).*

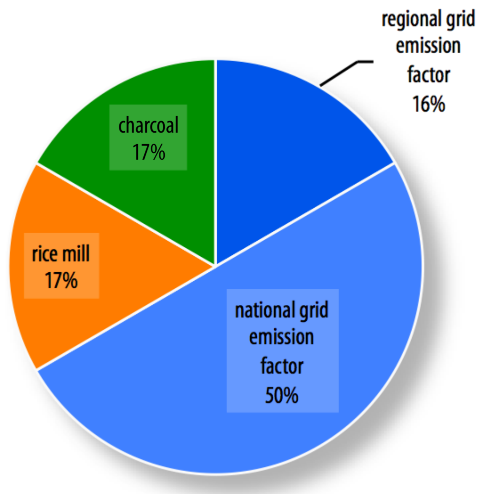

Figure 3: Overview of approved standardised baselines as of October 2014. *Source: UNFCCC (2014).*

The strong share of grid emission factors is no surprise. In fact, investment in a standardized grid emission factor can serve a long list of CDM projects. For example, nearly all renewable energy projects use a grid emission factor to calculate the CO_2 emissions abated. The electricity produced by the project facility (in kWh) is simply multiplied with the local grid emission factor to calculate the amount of more carbon intensive electricity that was substituted. Projects that target electrical efficiency calculate their emission reductions similarly. A national (or regional) grid emission factor has thus a very large 'customer basis' in terms of projects that could benefit from it.

Other SBs focus more on co-benefits of the projects that would use the SB. Examples are the charcoal SB in Uganda and the Ethiopian SB for rural electrification.

3.2 Choosing the Level of Aggregation

A second and maybe less obvious opportunity for strategic intervention is the question of how to define the sector that is subject to the SB. The CDM Executive Board has defined the level of aggregation in the context of the SB framework as follows: *"The level of aggregation measures the extent to which consolidation of information from any parts or units to form a collective whole is undertaken. This consolidation is usually done within a common sector, to provide information at a broader level to that at which detailed observations are taken. Information on categories can be grouped or aggregated to provide a broader picture when this does not lead to misrepresentation. It can also be split or disaggregated when finer details are required by too much non-homogeneity"* (CDM Executive Board 2011, §8a).

3.2.1 Sector Disaggregation as a Necessity

Sometimes it may be necessary to disaggregate the sector into smaller sub-sectors to be able to derive a meaningful SB. As the definition quoted above indicates, this may be the case if sectors do not produce one homogeneous output. An example would be the chemical industry that produces a large variety of different substances that are not comparable in terms of the inputs required nor the purposes they can be used for. A similar industry would be consumer electronics.

Equally difficult to provide a meaningful sector-specific SB for are cross-cutting technologies such as pressurized air that can be used in a host of different applications in all types of (industrial) sectors. While there might be large efficiency potentials, it is hardly possible to aggregate the very different applications in order to generate a meaningful benchmark.

Another problem for the development of a coherent benchmark appears when emerging industrial productions compete with manufacturing in traditional small-scale enterprises in one and the same sector. This is the case in many developing countries. Usually, modern large-scale industries dramatically outperform traditional labour-intensive small-scale manufacturing in terms of efficiency. Still, these manufacturing processes might provide income to thousands of people and therefore are extremely important to the host country's economy. Comparing the two parts in one SB would most likely result in an emission benchmark that is impossible to achieve for small-scale activities and would thus rule out any CDM activity for that part of the sector.

An example for this problem is the case of the Cambodian SB for the rice mill sector. In the country, a small number of large-scale rice mills (>3000 tonnes of annual rice production) contribute more than 60 per cent of the sectors total output. However, these large-scale rice mills are technically very different from the vast amount of small-scale rice mills (averaging 800 tonnes of annual rice production) that are being operated in the country. Consequently, the SB was proposed only for the part of the sector consisting of small-scale rice mills with an annual production below 3000 tonnes of rice (Kingdom of Cambodia 2013).

Generally, DNAs face a dilemma when deciding the appropriate level of aggregation: More aggregation serves a larger share of the sector and increases thus the basis of potential projects in which it can be applied; less aggregation may lead to SBs that more closely mirror the technical configuration of the sector under consideration and thus may improve environmental integrity. This is particularly the case when sectors are very heterogeneous in terms of output produced or production processes applied. The more one disaggregates, the closer one gets to traditional project-by-project CDM.

3.2.2 Sector Disaggregation to Strategically Advance the Climate Policy Agenda

Choosing the level of aggregation can also be used to pre-determine the type of mitigation options that are favoured by the proposed SB.

The SB framework allows for a dual approach for developing a SB. It can either be developed on the basis of approved tools and methodologies – the various grid emission factors discussed above were all developed using the *'Tool to calculate the emission factor for an electricity system'* (CDM Executive Board 2013b).

The other route to develop a SB is to follow the approach specified in the SB guidelines. This so-called performance penetration approach (PP) stipulates a way to derive a positive list of technologies, fuels or feedstock in a sector. In this approach, technologies/ fuels/ feedstock are ranked in descending order of their emissions intensity. The least emission intensive technology/ fuel/ feedstock needed to produce a certain percentage of the sector's output is selected as baseline technology/ fuel/ feedstock. All technologies/ fuels/ feedstock that feature lower emission intensities than the baseline technology are candidates for the inclusion in a positive list of technologies/ fuels/ feedstock that are automatically deemed additional. However, the SB Guidelines require to demonstrate additionality in a two-step approach. Candidates for the positive list that have been identified using the performance-penetration approach need to undergo further scrutiny in a second step. For each of the candidate technologies, fuels or feedstock it has to be established on a sectoral level that these are either not financially viable (i.e. through investment analysis) or are facing barriers.

Moreover, the baseline technology is not only used to condition the additionality of projects, it is also used to determine the crediting baseline against which emission reductions are calculated.

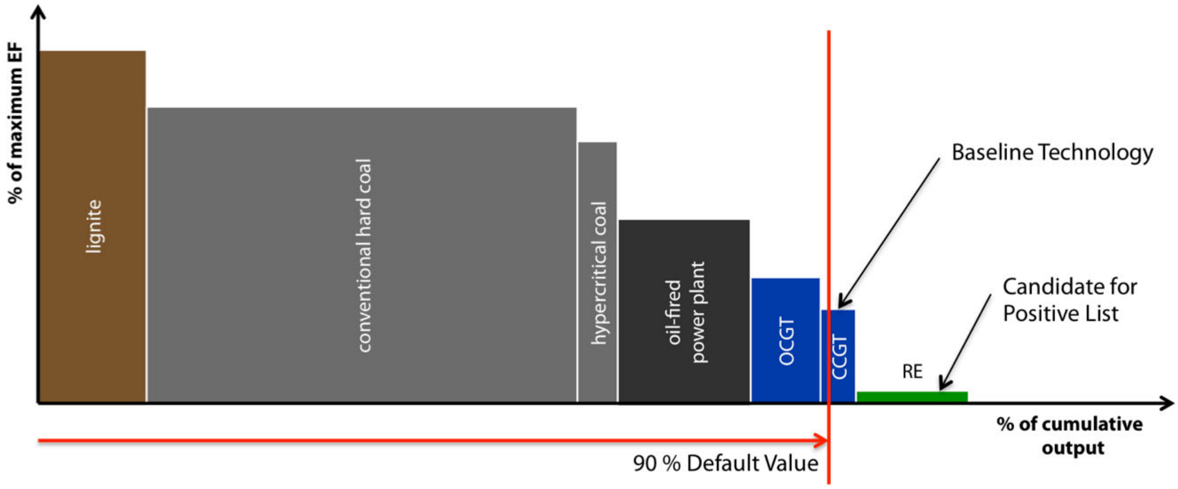

Figure 4: Illustration of the performance-penetration approach – full integration of the power sector.
Source: Wuppertal Institute.

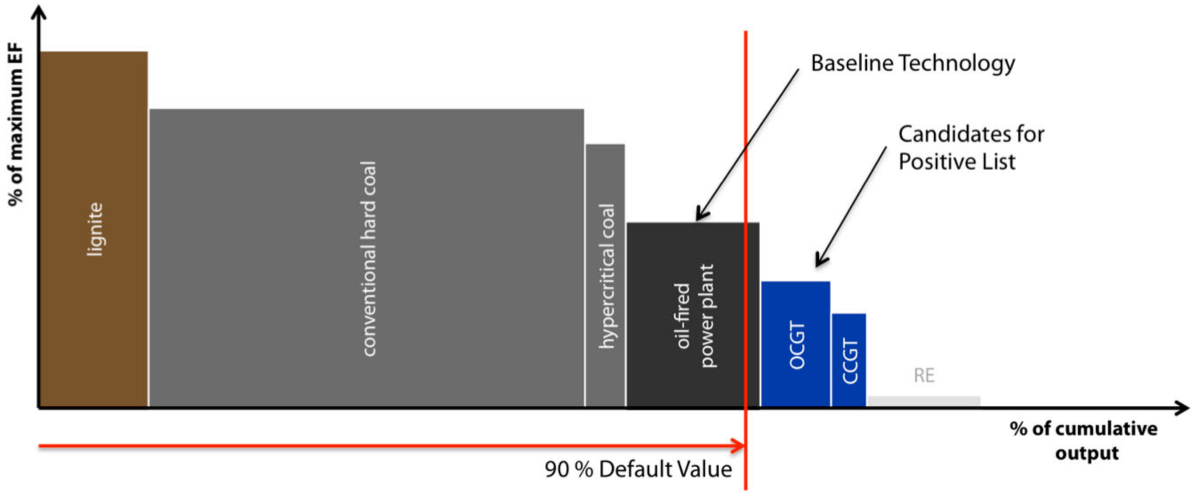

Figure 5: Illustration of the performance-penetration approach – fossil fuel generation capacity.
Source: Wuppertal Institute.

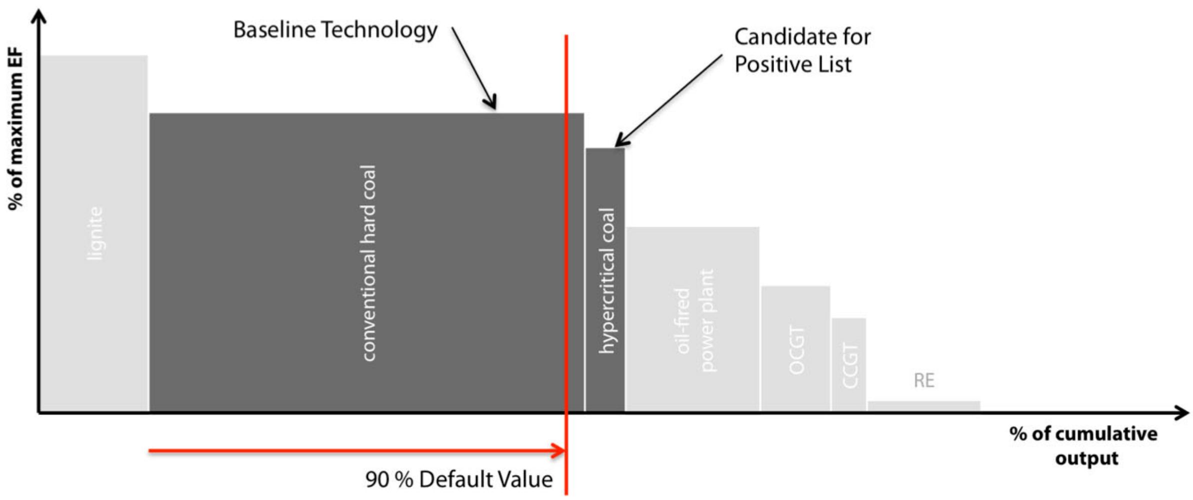

Figure 6: Illustration of the performance-penetration approach – hard coal generation capacity.
Source: Wuppertal Institute.

Figure 4 depicts an example of the power sector of a hypothetical country: All technologies that contribute to the sector's output are ranked as described above. The most polluting technology available is lignite, followed by conventional hard coal, more efficient hypercritical coal, oil-fired power plants, open cycle gas turbines (OCGT), combined cycle gas turbines (CCGT) and as the best performer renewable energies. The result is a step function as illustrated in the figure.

The CDM Executive Board has defined a preliminary additionality and crediting threshold, i.e. the percentage value that determines the baseline technology. The EB chose a value of 80 per cent for priority sectors – energy in households, electricity generation in isolated systems and agriculture – and 90 per cent in other sectors. Correspondingly, we chose 90 per cent as the value that determines the baseline technology in our example. The last, i.e. most efficient, technology that is needed to generate 90 per cent of the sectors output is the baseline technology – CCGT. The baseline technology also determines the baseline emission factor to calculate emission reductions which simply equals the emission factor of the baseline technology.

All technologies that are more efficient than the baseline technology – in this case only renewable energy technologies – are candidates for a positive list of the SB. In other words, **defining the level of aggregation over the entire power sector leads to a SB that supports the deployment of renewable energy.**

However, if the level of aggregation is altered in a way that only fossil fuel power plants are included in the SB (see Figure 5), the result of the performance-penetration approach shifts considerably. Again, all technologies that contribute to the output of the defined sector are ranked according to their performance. As renewable energy options are not included, the most efficient technology necessary to produce a cumulative 90 per cent threshold will change as the total output of the defined sector (fossil power generation) is different from the total power generation.

In our example, the 90 per cent threshold is exceeded by oil-fired power plants which is consequently identified as the new baseline technology. The baseline emission factor of the SB, now equalling the emission factor of oil-fired power plants, is significantly higher than in the first example. Also, both types of gas-fired power plants (OCGT and CCGT) perform better than the baseline technology and are thus candidates for the positive list of technologies that are deemed automatically additional. **Excluding renewable energies and reducing the level of aggregation to fossil fuel generation capacities only, results in a SB that incentivises fuel switch from coal and oil towards natural gas.**

To take this approach even further, one could imagine a SB specifically developed for (hard) coal fired power plants. The level of aggregation would be defined accordingly. As Figure 6 illustrates, in our example this would lead to a situation where conventional coal fired power plants are identified as the baseline technology and a corresponding relatively high baseline emission factor for the sector. In this scenario, hypercritical coal power plants would qualify as candidates for the positive list of additional technologies. **Limiting the level of aggregation to just coal fired power plants could lead to a SB that promotes the deployment of energy efficient technologies on the supply side.**

Obviously the different approaches are incompatible. It is hard to imagine that a measure is excluded in one positive list, but included in another positive list. Hence, when defining the level of disaggregation, DNAs need to take a conscious decision: they can use this option for strategic intervention to proactively shape their mitigation strategy to prioritize for example renewables over fuel switch or fuel switch over supply side energy efficiency measures.

Theoretically, though, this opportunity could also be used by private sector actors. If for example actors from the field of renewable energy develop a SB on their own and approach their national DNA, they could set facts over the mitigation priorities to some extent and thus gain a comparative advantage over their competitors. DNAs should therefore be aware and pay due consideration to SBs that are promoted by private sector organisations.

3.3 Mandatory or Voluntary Application of Standardised Baselines

Another crucial question in the process of developing a SB is the question whether or not a SB, once it is approved, should be mandatory for all newly proposed CDM activities or whether the use of the SB should be voluntary. Experts have repeatedly expressed their concerns that SBs, if not mandatory, could lead to a situation where project developers could cherry pick whatever option (SB or standard CDM) generates more CERs and is thus preferable for them. This could lead to a deterioration of the overall environmental integrity of the CDM (Spalding-Fecher and Michaelowa 2013; Schneider et al. 2012).

The CDM Executive Board has taken up the discussion at various occasions. Most lately, the issue was discussed at the 78th meeting of the CDM Executive Board in early April 2014. After a heated discussion, the Board decided to follow the interpretation of a legal analysis prepared by the UNFCCC Secretariat. The board concluded that following from the mandate provided in Decision 3/CMP.6 §47 it is at the discretion of the host countries' DNA to decide whether or not it wants to introduce a SB in the first play and whether or not it should be mandatory once it is approved (CDM Executive Board 2014c). However, the CDM Executive Board reserved its right to reject a proposed SB if it sees the environmental integrity of the SB endangered due to voluntary applicability of the SB (Arens 2014).

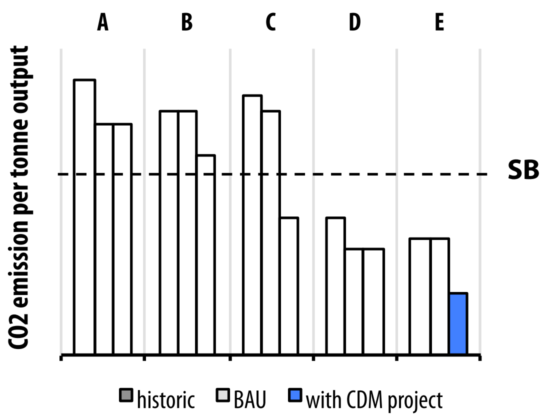

Figure 7: Mandatory or voluntary application of standardised baseline and its effects on different types of projects. *Source: Wuppertal Institute in the style of Spalding-Fecher and Michaelowa (2013).*

In the following paragraphs we will discuss if and under what conditions it may be reasonable to deviate from the recommended practice of mandatory application of SBs. We will demonstrate that the structure of the sector my be configured in a way that a mandatory SB can effectively exclude a certain type of projects, which could be a reason to allow for voluntary application of SBs.

In theory there are five different types of projects (illustrated in Figure 7). In this example we assume that the standardised benchmark emission factor is equal to a "standardised additionality baseline" (illustrated by the dashed line). Every technology that features specific emissions below this benchmark emission factor is automatically deemed additional.

Type A exemplifies a project that has no creditable mitigation potential, because the mitigation potential is already realized through business-as-usual (BAU) developments and even with this mitigation potential the project would not reduce its relative emissions below the benchmark emission factor established by the SB. Type A projects are not eligible for the CDM under a SB nor standard CDM.

Type B, instead, would be eligible under standard CDM methodologies as the project emissions are significantly below BAU emissions. However, as project emissions are still above the benchmark emission factor, this project would not qualify under a mandatory SB.

Type C represents a project that would be eligible both under SB and standard CDM methodologies. However, if the SB is used, the CERs issued to this project were significantly reduced. Under standard CDM methodologies the project would receive credits equalling the difference between BAU and the project emissions (difference between light grey column and blue column). Under the SB, however, it would only receive the difference between the crediting baseline (dashed line) and the project emissions (blue column). Hence, the project would chose to use the standard CDM methodology, if the applicability of the SB were voluntary. If mandatory, the project would be "under-credited" and generate net mitigation.

Type D represents a project that would not be eligible under standard CDM methodologies, because the project emissions equal the BAU emissions. However, under a SB it would be eligible, because project emissions are below the benchmark emission factor. The introduction of a SB will therefore inevitably lead to the generation of non-additional credits, if these kind of projects exist.

Type E is a project that, again would be eligible under both approaches. However, with the SB benchmark emission factor by far exceeding BAU emissions for this type of projects; with the application of the SB the project will be 'over-credited'.

So how should a DNA decide? Should it require new projects to apply an approved SB, or not? Principally, the literature seems to suggest a preference for the mandatory application of SBs, mainly because a more standardised approach to additionality demonstration is hoped to rule out fraudulent or at least highly uncertain additionality demonstration at the individual project level and will thus result in more objective criteria (Hayashi and Michaelowa 2012; Hayashi et al. 2010).

However, there may be cases where a mandatory application of the approved SB would lead to the exclusion of otherwise additional projects (represented by type B in our example above). If the sector comprises a large number of projects similar to this type, a mandatory applicability would significantly reduce the overall CDM potential of the sector. Such a scenario is not unlikely if both retrofit of existing facilities (brownfield projects) as well as newly constructed facilities (greenfield projects) are included under one and the same SB. For existing facilities it may well be impossible to achieve the same levels of efficiency as a newly constructed facility. If benchmark emission factors and additionality threshold are determined by a greenfield project, a mandatory SB would effectively eliminate any CDM projects in the subsector of brownfield projects.

3.4 Designing Quality Assessment and Quality Control Systems

As laid out in section 2.2 above, DNAs are in charge of establishing a QA/QC system. The first version of the corresponding guidelines received strong criticism for being too demanding especially for DNAs with limited capacities and at the same time providing little guidance on how to deal with imperfect data (e.g. Hermwille et al. 2013). The recent update of the QA/QC Guidelines, however, provides much more flexibility for DNAs in how they pursue their obligation. The new version now can be understood as a best practice manual instead of detailed prescriptions.

This gives DNAs some freedom in tailoring their QA/QC systems to their specific needs. It does allow to establish relatively straight forward QA/QC procedures that are very specific for the SB and have very little impact beyond. Still, this approach may not be recommended in all cases. Instead, a couple of initiatives demonstrate how data gathered in the process of SB development as well as institutional capacities developed can create synergies between the CDM and other fields of climate policy.

For example, the Cambodian DNA has integrated the data management for its rice mill SB with the data management for the development of national greenhouse gas inventories. [2] Other examples of synergies between data management for SBs under the CDM and other climate policy instruments include the use of SBs for the development of Nationally Appropriate Mitigation Actions (NAMAs). If a country considers to increase its ambition on mitigating climate change in a sector and to develop a NAMA, SBs and data collected to develop it can be invaluable. Burian et al. (2013) have demonstrated how a SB could serve as the basis for a NAMA for the Indonesian cement sector.

The Philippines have even gone further and developed a SB specifically for the purpose of building a holistic measurement, reporting, and verification (MRV) system for a NAMA in the rice cultivation sector. The SB that has bee submitted the UNFCCC Secretariat in May 2014 is to form a sound basis for the proposed NAMA (Republic of the Philippines 2014; Arnaoudov 2014). This example illustrates well how SBs in general and a robust QA/QC in particular can help to develop climate change mitigation instruments beyond the market based mechanisms. DNAs should therefore see the development of a sound QA/QC system as an investment in future climate policy capacities.

[2] Personal interview with Kamal Uy, Deputy Director of the Climate Change Unit of the Ministry of Environment of the Kingdom of Cambodia, 3 July 2013.

4 Conclusions

As opposed to the standard CDM, the role of host country governments is much more pronounced under SBs as the onus for submitting (and promoting) SBs lies with the host countries' DNAs. With this strategic opportunity comes also the responsibility of handling the data necessary for establishing and maintaining a SB.

We have identified a number of key stages at which DNAs may strategically intervene to design SBs in a way that complements well their respective national climate policy agendas.

Of course, DNAs can and should prioritize sectors for the development of SBs in the first place. DNAs should not only consider where there national priorities lie, but also for which sectors automatic additionality and/or sectoral benchmark emission factors can be most beneficial to spur the development of mitigation projects.

A second vantage point may be the definition of the right level of aggregation. We have shown that some times it is necessary to disaggregate the sector into smaller sub-sectors in order to be able to construct a meaningful SB. If the sectors are highly heterogeneous in either output or inputs, it may not be feasible to establish one SB to cover the entire sector.

We have also shown that deliberately choosing the level of aggregation may result in SBs that favour certain technologies, fuels or feedstocks and eliminate others from being eligible. We have exemplified this effect on a hypothetical power sector. By tweaking the level of aggregation it was possible to construct mutually exclusive SBs to promote renewable energy, to incentivise fuel shift or to promote supply-side energy efficiency measures.

Box 2: Key Questions for DNAs

DNAs play a central role in the development process of Standardised Baselines. This paper has laid out some of their key responsibilities. The following questions can guide DNAs in the development phase of a SB.

Prioritizing sectors

- What are national priority sectors?
- Where is the highest mitigation potential?
- Where is the highest potential for CDM projects?
- Where can a SB have the biggest impact on transaction costs?
- Which type of projects receive strongest demand?

Defining sector boundaries

- Is it necessary to divide the sector e.g. because of inhomogeneity?
- Does a subdivision of the sector favour/disfavour certain technologies or mitigation options?
- Should the application of the SB be mandatory for CDM projects?

Data management

- Where can synergies with other data management activities be realized (e.g. with GHG inventories or national statistics)?
- Can data gathered in the context of the SB be used in other context (e.g. NAMAs, New Market Mechanisms)?

The example was admittedly chosen to illustrate the potential effect. Not every power sector will be configured in a way to repeat this exercise. It depends on the combination of technologies available and their respective production shares whether or not it is possible to tailor a SB to specifically favour certain technologies. We still believe that in any case there is room for strategic decision making. DNAs should be aware of this room and make their decisions consciously and wary of their wider national climate policy agenda.

Furthermore, it is at the discretion of the host country to decide whether or not a SB, once approved, should be mandatory for the development of new CDM project activities, or not. The literature suggests that mandatory SBs are preferable because of the potentially detrimental effect of voluntary SBs. If voluntary, project proponents could cherry pick whatever approach generates more credits for them, this could effectively lead to over-crediting of CDM projects. Nevertheless, it may be advisable in specific cases to allow for voluntary application of SBs, for example the sector under consideration is heterogeneous (e.g. because both greenfield and brownfield projects are covered under the same SB) and a mandatory SB would effectively exclude CDM projects in some types of projects thus cutting the CDM project potential.

Last but not least, DNAs are in charge of establishing QA/QC systems. We recommend that data management for SBs should be integrated with other data handling practices such as development of greenhouse gas inventories or national statistics. There is a large potential for synergies in complementing existing data sets and developing data management capacities for multiple purposes. Data collected in the context of SBs could also be used for the development of other climate mitigation instruments such as NAMAs and/or NMM.

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